National Institute of Environmental Health Sciences

Comparative evaluation of life cycle assessment models for solid waste management

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Abstract:

This publication compares a selection of six different models developed in Europe and America by research organisations, industry associations and governmental institutions. The comparison of the models reveals the variations in the results and the differences in the conclusions of an LCA study done with these models. The models are compared by modelling a specific case - the waste management system of Dresden, Germany - with each model and an in-detail comparison of the life cycle inventory results. Moreover, a life cycle impact assessment shows if the LCA results of each model allows for comparable and consecutive conclusions, which do not contradict the conclusions derived from the other models' results. Furthermore, the influence of different level of detail in the life cycle inventory of the life cycle assessment is demonstrated. The model comparison revealed that the variations in the LCA results calculated by the models for the case show high variations and are not negligible. In some cases the high variations in results lead to contradictory conclusions concerning the environmental performance of the waste management processes. The static, linear modelling approach chosen by all models analysed is inappropriate for reflecting actual conditions. Moreover, it was found that although the models' approach to LCA is comparable on a general level, the level of detail implemented in the software tools is very different.

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Unspecified Exposure

Geographic Feature:

resource focuses on specific type of geography

None or Unspecified

Geographic Location:

resource focuses on specific location

Non-United States

Non-United States: Europe

European Region/Country: European Country

Other European Country : Germany

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Health Outcome Unspecified

Mitigation/Adaptation: ☑

mitigation or adaptation strategy is a focus of resource

Mitigation

Model/Methodology: ☑

type of model used or methodology development is a focus of resource

Cost/Economic, Methodology, Other Projection Model/Methodology

Other Projection Model/Methodology: Life Cycle Assessment (LCA) models

Resource Type: ☑

format or standard characteristic of resource

Research Article, Research Article

Timescale: ☑

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content